

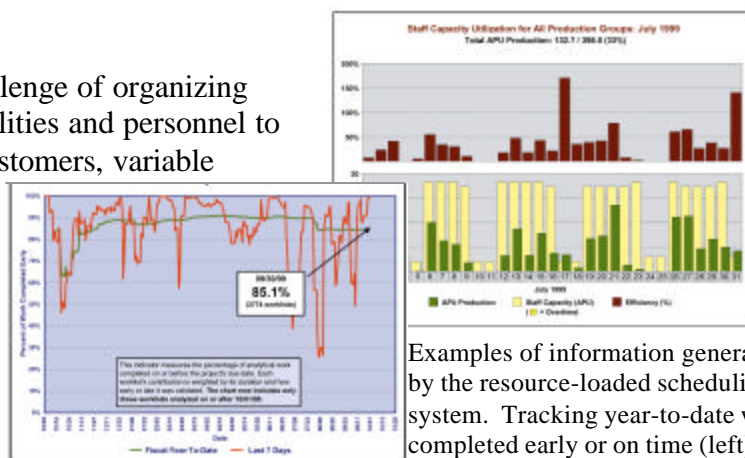


Automated Resource-Loaded Scheduling of Production Activities

The Challenge

Analytical laboratories are faced with the challenge of organizing day-to-day workload to effectively utilize facilities and personnel to meet production commitments for multiple customers, variable product specifications and uneven production flow. This challenge is further complicated by personnel technical qualifications, equipment availability, support personnel, and maintenance and calibration activities.

An example of this type of production environment at Hanford is the Waste Sampling and Characterization Facility (WSCF). This facility provides a wide range of sample processing, chemical analyses, and data reporting for many Hanford customers.



Examples of information generated by the resource-loaded scheduling system. Tracking year-to-date work completed early or on time (left), and staff utilization results (above).

An improved method is needed to organize the day-to-day workload and to plan future work so that personnel and facilities are effectively utilized, backlogs are minimized and, ultimately, the projects are completed early or on time.

Current Approach

Waste Management Laboratory supervision provides general guidance to the analysts at the bench regarding work that “should be performed.” Due dates and sample availability information is available from the Laboratory Information Management System (LIMS) to help organize their work. The analysts make the call regarding what is worked on a given day. The successful completion of a project relies on the attention paid and the influence exerted by project coordinators. The laboratory does not have highly reliable methods for predicting its ability to accommodate proposed work while taking into account its current commitments.

New Technology

A software system providing resource-loaded scheduling of the analytical workload is being adapted for, and implemented at, the Waste Sampling and Characterization Facility. This system was initially developed and implemented at the 222-S Laboratory and has been modified for application at WSCF.

Benefits and Features

- ◆ Systematic and strategic approach to resource tracking and allocation
- ◆ Prescriptive work schedules
- ◆ Progress and performance monitoring tools
- ◆ Predictive tools for planning future work

The foundation for this software is the Microsoft *Office 97* application suite, primarily *Access 97*. Substantial customized code has been added to implement the scheduling algorithm, catalog and track the resources, link with the LIMS, generate status reports and charts, monitor laboratory performance, and distribute the work schedules. The proprietary resource-loading algorithm takes into account individual project due dates, facility status (availability of workstations and maintenance activities), personnel availability (work schedules, days off, training, etc.), personnel qualifications (specific training on analytical methods), and workstation backlogs in the prioritization of the workload and in the assignment of this work to analysts and workstations.

Each day a production schedule, consisting of a task list, is generated for the analytical staff showing the work that should be completed. Daily feedback is obtained and work not completed is returned to the system for reconsideration during the generation of subsequent schedules. This approach provides systematic, logical, and strategic guidance for getting the work done. The process is built into the laboratory's infrastructure rather than being

reliant on the variable behaviors of individual analysts, chemists, and project coordinators. This technology enables the laboratory to quantitatively model the optimum analytical capacity and predict the ability to accommodate future work.

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